Comparison of intraoperative and postoperative pain during canine ovariohysterectomy and ovariectomy

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Abstract — This study compared physiologic parameters indicating nociception during surgery and pain scores after surgery among dogs undergoing ovariohysterectomy (OHE) and ovariectomy (OVE). Twenty healthy adult female dogs were randomly assigned to either the OHE or the OVE group. Physiologic data collected during surgery included heart rate, respiratory rate, temperature, blood pressure, hemoglobin oxygen saturation, end-tidal CO_2 and isoflurane, and vaporizer settings. Postoperative pain was measured using the short form Glasgow Composite Pain Scale, an interactive visual analog scale, and algometry. There were no clinically relevant differences in intraoperative nociception indices between groups. Duration of surgery for OVE was significantly shorter than for OHE (OVE 15.4 minutes, OHE 17.5 minutes, $P = 0.04$). There was no significant difference between groups in the use of rescue analgesia after surgery, in the average interactive visual analog scale score over the 24-hour postoperative period ($P = 0.12$), and in algometer readings ($P = 0.34$).

Résumé — Comparaison de la douleur peropératoire et postopératoire durant l'ovariohystérectomie et l'ovariectomie canines. Cette étude a comparé les paramètres physiologiques indiquant la nociception durant la chirurgie et la cotation des douleurs après la chirurgie parmi les chiennes subissant une ovariohystérectomie (OHE) et une ovariectomie (OVE). Vingt chiennes adultes en santé ont été réparties au hasard soit au groupe OHE ou au groupe OVE. Les données physiologiques recueillies durant la chirurgie incluaient la fréquence cardiaque, la fréquence respiratoire, la température, la tension artérielle, la saturation en oxygène de l'hémoglobine le PCO_2 et l'isoflurane de fin d'expiration ainsi que les réglages du nébuliseur. La douleur postopératoire a été mesurée à l'aide de la forme abrégée de l'échelle de douleur composée de Glasgow, d'une échelle analogue visuelle interactive et de l'algométrie. Il n'y avait pas de différences pertinentes sur le plan clinique dans les indices de nociception peropératoire entre les groupes. La durée de la chirurgie d'OVE était significativement plus courte que celle d'OHE (OVE 15,4 minutes, OHE 17,5 minutes, $P = 0,04$). Il n'y avait aucune différence significative entre les groupes pour le recours à un analgésique de secours après la chirurgie, dans la note d'échelle visuelle interactive moyenne pendant la période postopératoire de 24 heures ($P = 0,12$) et dans les lectures de l'algésimètre ($P = 0,34$).

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Introduction

Ovariohysterectomy (OHE) and ovariectomy (OVE) are common procedures for sterilization of female dogs. In a retrospective study on the long-term effects of OHE and OVE in dogs, no differences were detected in complication rates between the 2 procedures (1). Similar incidences of vaginal discharge (2 of 69 in the ovariectomy group and 2 of 66 in the ovariohysterectomy group) and urinary incontinence (6 of the ovariectomy group and 9 of the ovariohysterectomy group) were noted between these 2 groups. The authors concluded that there was no indication for removing the uterus (1). A review of articles published between 1967 and 2004 revealed no significant differences between the 2 techniques in the incidence of long-term postoperative urogenital complications, including endometritis, pyometra, and urinary incontinence (2). The potential advantages of OVE noted were that it is less technically complicated, less time consuming, and associated with less morbidity due to a smaller incision and less intraoperative trauma (2). A 2011 study stated "Ovariectomy has replaced OHE as the preferred procedure for neutering healthy female dogs in many European countries" based on the potential advantages described above (3).

The purpose of our study was to investigate and compare intraoperative physiologic changes and postoperative pain scores in dogs undergoing OHE and OVE. We hypothesized

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that there would be a significant difference in intraoperative physiologic parameters indicating nociception (elevated heart rate and blood pressure) in dogs undergoing OHE compared to dogs undergoing OVE. We also hypothesized that there would not be a significant difference in postoperative pain scores or algometry between these 2 procedures.

Materials and methods

The study was approved by the institutional animal care committee. Twenty healthy adult female dogs were obtained from 2 local humane society shelters. Informed consent was obtained from the shelter veterinarians of each shelter. Exclusion criteria included signs of illness or cardiovascular abnormalities, evidence of estrus, and pregnancy as noted on physical examination. Body weight ranged from 3.3 to 30.1 kg. The dogs were individually housed in an isolated ward prior to surgery, during recovery, and during pain assessment. The dogs were acclimatized to this ward for a minimum of 24 h before surgery. The dogs were fed a maintenance diet within 2 h of extubation and walked outside 4 times daily. After recovery from anesthesia and data collection, the dogs were returned to the humane societies for adoption.

Randomization software (http://www.graphpad.com/quickcalcs/randomize1.cfm) was used to assign each dog to 1 of 2 treatment groups: OHE or OVE. Prior to surgery a full physical examination was performed. Body temperature, heart rate (HR), respiration rate (RR), capillary refill time, mucous membrane color and body weight for each dog were measured and recorded. Body condition scores and American Society of Anesthesiologists physical status classifications were assigned and recorded. Blood was collected from each dog for measurement of packed cell volume, total protein, blood urea nitrogen (Azostix Siemens Diagnostics; Siemens Canada, Mississauga, Ontario) and blood glucose levels (AlphaTrack2; Abbott, Ottawa, Ontario) prior to fasting.

Anesthesia

Each dog was administered carprofen (Rimadyl; Pfizer, Kirkland, Quebec), 4 mg/kg body weight (BW), SC, 30 min prior to induction of anesthesia. An IV catheter was placed in the cephalic vein and anesthesia was induced with propofol (Diprivan; AstraZeneca, Mississauga, Ontario), 6 mg/kg BW, IV. If insufficient relaxation for intubation was achieved with this dose, additional propofol was administered IV to effect. Anesthesia was maintained with isoflurane (Forane; Pharmaceutical Partners of Canada, Richmond Hill, Ontario) in 100% oxygen delivered via an endotracheal tube. Heart rate, RR, systolic blood pressure (SAP), mean blood pressure (MAP), diastolic blood pressure (DAP), hemoglobin oxygen saturation, end-tidal carbon dioxide ($ETCO_2$), and end-tidal isoflurane (ETIso), were measured using a multi-parameter anesthetic monitoring device (Datex-Ohmeda; General Electric, Little Chalfont, UK), which was routinely calibrated. Isoflurane vaporizer setting, oxygen flow rate, palpebral reflex, eye position, jaw tone, and body temperature were recorded.

The isoflurane vaporizer setting was adjusted to provide a plane of anesthesia that maintained a relaxed jaw tone, a ventral eye position and absence of a palpebral reflex. Evaluation of anesthetic depth and adjustment of the vaporizer were performed by a single board certified anesthesiologist (BA) who was blinded to the surgical procedure being performed. Physiologic and instrument setting recordings were performed every 2 min from the time of induction until extubation.

Surgery

Ovariohysterectomy was performed through a ventral midline celiotomy, centered approximately in the cranial third of the distance between the umbilicus and pubis. Each ovary was removed together with the uterus to a level just cranial to the cervix. The suspensory ligament was torn using digital pressure during isolation and exteriorization of the ovary. Hemostasis of the ovarian and uterine vasculature, and sealing and division of the broad ligaments were achieved using a bipolar vessel sealing device (LigaSure5 mm blunt tip 20 mm sealer and divider; Covidien, Minneapolis, Minnesota, USA). The uterine body was sealed and divided using the vessel sealing device when the uterine body was $\leq$ 9 mm (4). When the uterine body exceeded 9 mm, as confirmed by blade handle measurements, a single circumferential ligature of 2-0 PDSII (Ethicon; Johnson & Johnson, Somerville, New Jersey, USA) was placed prior to transection of the uterus. The linea alba was closed in a simple continuous pattern using PDSII with suture sized appropriately for each dog. The subcutaneous tissue was closed using 3-0 Monocryl (Ethicon; Johnson & Johnson) in a simple continuous pattern, and the skin was closed with the same suture in an intradermal pattern.

Ovariectomy was performed through a ventral midline celiotomy centered over the umbilicus. The ovaries were removed by sealing and dividing the proper ligament of the ovary, suspensory ligament and the ovarian pedicle using the vessel sealing device. The suspensory ligament was not torn during OVE. Closure was identical to that described for OHE.

All surgeries were performed by a single board-certified surgeon (SS). The incision length was recorded for each dog. The duration of each phase of surgery and of the entire surgery was recorded.

Anesthesia and surgery were divided into phases. For a baseline measurement, and to achieve a constant plane of anesthesia before surgery, phase 0 began with induction and ended with initiation of the skin incision. Phase 1 began with initiation of the skin incision and ended when one of the ovaries was grasped. Phase 2 began with manipulation of the first ovary and ended at initiation of body wall closure. Phase 3 represented abdominal closure and suturing of subcutaneous tissue and skin.

Pain assessment

Each dog was assessed at 1, 2, 4, 6, 8, 12, 18, and 24 h after surgery by 1 blinded observer (AT). Temperature, HR, and RR for each dog was measured at each evaluation. A short form Glasgow Composite Pain Scale (GCPS) assessment was performed at each time point (5). The GCPS includes 30 descriptors in 6 behavioral categories. The descriptors are ranked numerically according to their associated pain severity. The observer assigns the appropriate descriptor in each category and totals the scores. Dogs with a score of 5/24 or greater were administered rescue pain medication in the form of buprenorphine (Vetergesic; Reckitt Benckiser Healthcare, Hull, UK), 15 μg/kg BW, SC (5). Following this assessment, an interactive visual analog scale (IVAS) 10 cm long was also used at each evaluation. Interaction involved removing the dog from the kennel, petting the dogs, offering treats, talking to the dogs and noting their responses to the observers. The right side of the line represented unbearable pain and the left represented no pain. A mark was made on the line to correspond to the observer's perception of the pain felt by each dog at each evaluation. The distance of the mark from the left side of the line was measured and recorded.

An algometer (Topcat Metrology Pressure Rate Onset Device; Topcat Metrology, Little Downham, UK) was used to measure wound sensitivity. To test the mechanical wound threshold a rounded plastic tip was used (diameter of the rounded head = 8 mm) to apply steadily increasing pressure until the animal showed a response. Any sudden movement of the dog away from the device, attempting to stand, turning the head towards the device, vocalization, or attempts to bite were considered a response. Pressure was then instantly released and the applied force (Newton, N) was read from the display. The algometer provides guidance to the user in the form of red and green lights for the application of a constant rate of pressure increase. The algometer's technical specification of force range of 0.5 to 20 N is accurate to +/− 1 N; all readings above 20 were recorded as 20 N. Dogs were placed in left lateral recumbency and 3 algometer readings were obtained 1 cm cranial to the cranial edge of the incision on each dog prior to premedication and at each observation time point after surgery. The average of the values at each time point was used for statistical analysis.

Statistical evaluation

A prospective power analysis was performed based on a clinically significant difference of 15 mm for the IVAS, an alpha of 0.05, and a beta of 0.2. Significance for all tests was set at $P < 0.05$. A sample size of 20 animals was sufficient to determine significant difference between groups. Statistical software (STATA 12; StataCorp LP, College Station, Texas, USA) was used for analysis.

Average SAP, MAP, DAP, and HR in each phase and blood pressure and HR changes between phases of surgery were compared using a 2-sample *t*-test with equal variances between the 2 treatment groups. Following visual inspection the data were pooled over the 24-hour period for subsequent analysis.

End-tidal averages in each phase and changes between phases of surgery, total surgery duration and duration of each phase of surgery, and incision lengths were compared with a 2-sample *t*-test with equal variance between the 2 treatment groups.

The use of rescue pain medication based on short form GCPS score was compared with a Pearson's Chi-squared test. Each patient's average IVAS score over 24 h and peri-incisional algometer readings over 24 h were compared between the 2 treatment groups with a two-sample *t*-test with equal variance. Patients that received rescue pain medication continued to be assessed and included in the analysis.

Results

There were no significant differences in average values of SAP, MAP, DAP in each phase between procedures (Table 1). All blood pressure measurements increased from baseline measurements in phase 1 and again between phases 1 and 2, but declined between phases 2 and 3 (Table 1). The only statistically significant differences were in the changes of blood pressure between phases. There was a greater increase in MAP between phase 1 and 2 in the OHE group ($P = 0.02$). The average increase in MAP in the OHE group was 25 mmHg +/− 14, while the average increase of MAP of the OVE group was 9 mmHg +/− 15. There was also a greater increase in the DAP between phase 1 and 2 in the OHE group ($P < 0.01$). The average increase of DAP in the OHE group was 27 mmHg +/− 13, while the average increase of DAP in the OVE group was 6 mmHg +/− 14. The MAP and DAP changes between phases 2 and 3 were not significant ($P = 0.93$ and $P = 0.23$ respectively).

There were no significant differences between groups in HR in phases 1 and 2 or HR changes between phases of surgery. The HR of the OVE group was greater than that of the OHE group during phase 0 and during phase 3 (Table 1).

The ETIso for the OHE group was lower during phase 1 and phase 2 of surgery than for the OVE group. There was no difference during phase 3 or between the phases (Table 1).

The OHE procedure was of significantly greater duration than the OVE procedure ($P = 0.04$). The average OHE procedure was 17.5 +/− 2.4 min and the average OVE procedure was 15.4 +/− 1.7 min. There were no significant differences between groups in duration of phase 0, phase 1 or phase 2; however, the duration of phase 3 was greater in the OHE group compared to the OVE group (Table 1).

The OHE skin incision lengths were significantly greater than the OVE incisions ($P = 0.02$). The average skin incision length of the OHE was 6.4 +/− 0.7 cm, while the average skin incision length of the OVE was 5.3 +/− 1.1 cm.

There was no significant difference between groups in the use of rescue analgesia after surgery (1 in each group) as determined by GCPS results ($P = 0.37$), in the average IVAS score over the 24-hour postoperative period ($P = 0.12$) or in algometer readings ($P = 0.34$).

There were no significant differences between groups in body weight [OHE mean 19.25 kg SD +/− 7.0, OVE mean 17.53 kg SD +/− 6.5 ($P = 0.58$)].

There were no complications in any of the dogs during surgery or before discharge at 24 h following the conclusion of the study.

Discussion

The 4 phases for the OHE and OVE procedures were established by Höglund et al (6) in a comparison of laparoscopic OVE and open OHE. Division of the procedures into phases allowed for identification of changes during portions of the procedures that were expected to be most relevant in revealing differences. It also allowed for steady state anesthesia to be reached in phase 0 prior to any surgical stimulation. The study showed that the differences between the 2 techniques could be

Table 1. Comparison of parameters (mean ± standard deviation) measured during the 4 phases of the surgery

	Phase 0			Phase 1			Change from Phase 1 to Phase 2			Phase 2			Phase 3		
Parameter	OVE	OHE	*P*-value	OVE	OHE	*P*-value	OVE	OHE	*P*-value	OVE	OHE	*P*-value	OVE	OHE	*P*-value
HR (bpm)	127 ± 17	114 ± 17	**0.04**	128 ± 13	116 ± 20	0.15				126 ± 14	114 ± 12	0.07	116 ± 14	103 ± 12	**0.03**
SAP (mmHg)	108 ± 17	103 ± 9	0.22	121 ± 21	111 ± 14	0.23				133 ± 18	134 ± 18	0.92	126 ± 15	123 ± 15	0.67
MAP (mmHg)	69 ± 13	63 ± 10	0.13	87 ± 17	74 ± 16	0.08	9 ± 15	25 ± 14	**0.02**	97 ± 15	98 ± 18	0.84	86 ± 13	87 ± 14	0.86
DAP (mmHg)	46 ± 10	43 ± 10	0.23	63 ± 15	51 ± 16	0.10	6 ± 14	27 ± 13	**< 0.01**	69 ± 16	78 ± 20	0.30	64 ± 12	65 ± 17	0.91
ETIso (%)	2.1 ± 0.5	1.9 ± 0.3	0.15	2.3 ± 0.4	1.9 ± 0.2	**0.02**				2.3 ± 0.4	1.9 ± 0.3	**0.03**	1.8 ± 0.4	1.5 ± 0.3	0.09
Time (min)	12.3 ± 3.0	10.4 ± 4.7	0.15	28 ± 1.3	1.9 ± 0.9	0.09				4.5 ± 1.4	6.0 ± 2.0	0.07	7.9 ± 1.1	9.6 ± 1.2	**0.01**

Phase 0 was from induction to skin incision. Phase 1 was from skin incision to manipulation of the first ovary. Phase 2 was from manipulation of the first ovary to body wall closure. Phase 3 was from body wall closure until completion of skin closure. There were 10 dogs in each of the 2 groups. A 2-sample *t*-test was performed on each phase between the OVE and OHE groups and to compare changes between phases. Significant differences (*t*-test) are indicated in bold. OVE — ovariectomy group; OHE — ovariohysterectomy group; HR — heart rate; SAP — systolic pressure; MAP blood pressure; DAP — diastolic pressure; ETIso — end-tidal isoflurane.

isolated to phase 2, representing organ removal (6). This study also showed that repeated non-invasive blood pressure measurements could be used as an indicator of intraoperative trauma (6).

Our first hypothesis was that there would be a difference between OHE and OVE in intraoperative physiologic parameters. Our data showed only slight differences. The significantly greater increase in MAP and DAP in the OHE group between phases 1 and 2 may be because the OHE was more stimulating. However, the average ETIso during phases 1 and 2 was also significantly lower in the OHE group, and could also be responsible for the greater increase in MAP and DAP in the OHE group.

We suspect that the significantly greater increase in MAP and DAP in the OHE group between phases 1 and 2 was due to increased stimulation during handling of the suspensory ligament. For the OHE, the suspensory ligament was torn using digital pressure, whereas for the OVE, a vessel sealing device was used to divide the ligament. In the OVE procedure the incision is more cranially placed, centering the activity directly over the ovaries. This location requires less caudal retraction of the ovaries and usually does not require tearing of the suspensory ligaments to ligate the ovarian pedicle. We anticipated that the manual tearing of the suspensory ligament would be more stimulating than use of the vessel sealing device. Manual rupture of the ligament involves tearing the ligament from its cranial attachment sites using tension to the point of failure. When sealing and dividing the ligament with the vessel sealing device, there was little to no tension placed on the ligament. It is possible, however, that despite the lack of the tension on the ligament, division of the ligament with the vessel sealing device was more stimulating than we expected, thereby diminishing a difference between groups in the response to treatment of the ligament.

Manipulation of the suspensory ligament and removal of the ovary has been recognized as the most stimulating portion of the spay and surgical trauma has been noted to result in blood pressure changes during OHE and OVE procedures (6). We expected that we would have observed an increase in SAP, as was noted between phases 1 and 2 in the study by Höglund et al (6). The increase in SAP between phases 1 and 2 was also observed by the same researchers in a follow-up study in which a pause of 15 min was introduced after the removal of each ovary in order to ensure a steady state of anesthesia before removal of the second ovary (7). While a statistically significant increase in MAP and DAP was noted between phases 1 and 2 in our study, there was no statistically significant increase in SAP.

The increase in SAP between phases 1 and 2 in the OHE group was 22.8 mmHg and in the OVE group was 12 mmHg ($P = 0.09$). This approaches but does not reach statistical significance. Transient differences in blood pressure during the procedures in our study may not have been recognized with the 2-minute monitoring interval we used. Continuous monitoring may have allowed us to recognize transient blood pressure changes that occurred within a 2-minute period. Also, we used non-invasive blood pressure (NIBP) monitoring. While NIBP was used in both studies by Höglund et al (6,7), direct blood pressure monitoring via an arterial catheter may have revealed changes that our monitoring equipment did not detect. However, since changes in MAP and DAP were found despite intermittent monitoring, we are uncertain as to why SAP did not show a similar pattern.

The significantly greater increase in MAP and DAP in the OHE group between phases 1 and 2 may correspond to this group's significantly lower average ETIso during phase 1 and phase 2. Higher ETIso is associated with vasodilation, which could account for the comparatively lower pressures of the OVE group. Differences in duration of the phases between groups could potentially contribute as well; however, the durations of each phase were not significantly different; therefore, the effects of phase duration was likely minimal. These are unexpected findings as OVE procedures require less abdominal organ manipulation; therefore, in theory, the OVE procedure should require less isoflurane to maintain an adequate plane of anesthesia.

There was a significantly higher average HR during phase 3 of the surgery in the OVE group. This difference of 14 beats/min may not be clinically relevant. Heart rate in itself cannot be correlated to intraoperative nociception. This elevation occurred at a time when differences between the procedures are unappreciable, as this phase represents incision closure, which was performed in identical fashion in both groups.

Incision lengths were statistically significantly shorter by 1.05 cm in the OVE group, and surgery duration was 2.1 min less for the OVE group. While these results were statistically significant, the clinical relevance is questionable. Achieving an incision length as short as possible was not an objective of our study.

Our second hypothesis was supported by the data as neither GCPS nor IVAS scores revealed any significant differences in post-operative pain between the groups. All dogs were awake and eating within 2 h of the procedures. Peeters et al (3) also found no significant difference in postoperative pain between OHE and OVE in dogs. We added algometry to further quantify differences after surgery but this did not identify a statistical difference between groups. This suggests that either the difference in pain is too subtle for us to detect with current pain measurement methods or that there truly are no differences in postoperative pain between the 2 procedures. The GCPS is a behavior-based assessment tool to evaluate acute pain in dogs (5). The GCPS is a standardized evaluation system that is intended to decrease variation among observers. Wagner et al (8) used GCPS as an assessment tool and showed pain-related behaviors were mitigated by the administration of analgesics. All dogs received a preoperative dose of carprofen; therefore, potential differences between the groups may have been diminished due to the analgesic. In a study evaluating carprofen and buprenorphine in premedication protocols, either one used independently provided adequate analgesia (9). Holton et al (10) found that while visual analog scales are commonly used in human medicine, they show observer variability when assessing dogs. These assessments have shown greater agreement when patients are in more severe pain (11). It is possible in our study that the pain experienced was sufficiently mild to lack a notable significant difference between groups.

Algometry was used to increase the objectivity of our post-operative pain scoring and to quantify superficial pain around the incision. In this study wound lengths were 1.05 cm different in average length. Pain threshold assessments of these wounds were unlikely to be significantly different. Although intra-abdominal pain assessment may have been a more accurate measure for our study, we are unaware of an effective method of quantitatively measuring pain originating from within the peritoneal cavity in dogs. It is possible that the use of the 8-mm tip diameter may have also obscured differences herein. An inconsistency in patient reactions and higher mechanical thresholds were noted with larger diameter probes in a recent study (12). Also, all dogs quickly became acclimated to the routine of assessments followed by positive reinforcement and were very compliant. A high degree of tolerance to both positioning and use of the algometer was noted in the dogs. This is in agreement with a recent study that found that effect of the individual dog is the predominant factor in mechanical threshold testing (12). We found immediate acceptance of application of the algometer. This may be due to the temperament of the dogs, which were obtained from a humane society, similar to another study in which client-owned pets quickly showed avoidance behaviors (13).

The change in MAP and DAP between phase 1 and phase 2 of OHE was significantly greater than for OVE, which may correspond to a greater level of nociception experienced during OHE or may be secondary to the higher levels of isoflurane in phases 1 and 2 in the OVE group. Follow-up studies will include continuous monitoring of physiologic parameters, especially during manipulation of the suspensory ligament and organ removal. There were no differences in postoperative measures of pain between groups. This may be due to an inability of our pain detection methods to ascertain subtle differences, or it may be that there is no difference in postoperative pain experienced between the two procedures. Although we did not find a dramatic difference in our indices of nociception experienced during these procedures, the frequency with which they are performed warrants further investigation of the pain induced.

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Book Review
Compte rendu de livre

Small Animal Soft Tissue Surgery, 2nd edition

Thieman Mankin KM, ed. 2015. CRC Press, Boca Raton, Florida, USA. 224 pp. ISBN: 9781-4822-2538-9. $37.36 US.

This book contains 212 scenarios which are the basis for over 425 quiz-type questions. The front of every page has 2 scenarios, each case is followed by 2 to 4 questions that integrate diagnostic, anesthetic, surgical, and post-operative considerations. The answers, including thorough explanations, are on the back of the page. The front and back page format of this book is convenient, no holding your place while flipping to the back of the book. The photos used are of exceptional quality and add considerable depth and detail to the cases presented. The writing is clear, easy, and interesting to follow. The scenarios and solutions used are current, describing the latest treatment modalities and using up-to-date standards of care. This book is part of a series of 22 other question/answer review style books, and is available in a compact soft cover or hard copy, as well as various electronic formats including a Kindle and pdf format from the publisher, making it extremely portable.

This book has many strengths, and is perhaps a "must have" for the earnest intern or the surgical resident approaching his or her Board Exams. I would not, however, recommend this book to general practitioners, except perhaps to use as a diversion, similar to the CVJ's Quiz Corner, during a slow point in the day. The description on the cover, "Self-Assessment Color Review," sums this book up well.

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